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SYNOPSIS OF THE AMERICAN CALLIPHORIDAE (DIPTERA).

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A study of the American (North, Central and South America, West Indies and Galapagos Islands) Calliphoridae in the collection of the U. S. National Museum, which contains a nearly complete representation of all the species recorded from America, has permitted the writer to prepare this brief synopsis of practically all of the known American flies of the family Calliphoridae. This is the first attempt to treat all of the species occurring in this region.

In addition to studying the collection of the National Museum the writer, while in Europe (1925), had, through the courtesy of Mons. E. Segúy, the opportunity to examine the remaining types of Robineau-Desvoidy and Macquart collections in the Paris Museum, and through the courtesy of Major E. E. Austen the Walker types in the British Museum. While examining these collections a few species which were not represented in our National Collection were seen and a number of synonyms discovered.

During the last year (1925) the writer has examined several large collections of North American Calliphoridae, submitted to him for identification. Chief among these were: The collection of the Dallas, Texas, laboratory of the Bureau of Entomology (submitted by F. C. Bishopp); a collection made in Alaska by Professor J. S. Hine; material from Washington State loaned by Professor A. L. Melander; material from western Canada loaned by Owen Bryant; a collection from Canada loaned by C. Howard Curran. In addition to these collections Mr. C. W. Johnson, Dr. F. R. Cole and the University of Kansas have sent me important specimens for examination. This material has supplied several new species as well as the unknown sex of several species which had been previously described from one sex only.

To all of the above named gentlemen and also to Dr. J. M. Aldrich, Mr. J. R. Malloch, and my wife, Elnora S. Shannon (for assistance in recording data, etc.), I wish to extend my thanks for their interest and assistance in the present paper.

A short list of the more important recent papers bearing on the group is appended at the end and references to all of

the previously described species are found therein. This includes Townsend's catalogue of the South American Calyptrate Muscidae which contains the bibliography of the older papers.

Perhaps most or all of the indigenous species of North America are now known. Three genera, *Protocalliphora*, *Sterinomyia* and *Melanodexia*, however, require more material and study before we can be sure of the limits and the number of their species. These are the only genera in which one or the other sex of some of the species remain unrecognized.

The number of species of Calliphoridae, aside from the genus *Mesembrinella*, inhabiting Central and South America, is apparently quite limited, although about three times the number of names have been given to them. This large number of synonyms has caused considerable confusion and made the identification of species very difficult. The papers by Dr. Aldrich (1922 and 1925) have helped considerably in stabilizing our knowledge of the two largest groups of this region, the Mesembrinellinae and Chrysomyiini, and his key to the former group is reproduced herein.

Aside from the Mesembrinellae, the Calliphorid fauna of tropical America and the regions southward appears to be a scant one, at least in collections. The number of new forms awaiting discovery may, however, be large and therefore the present paper should be considered of a provisional nature for this region and mainly applicable to the common species.

The flies of the family Calliphoridae, like the house-fly, are commonly known to every one, and some of them have well established common names such as the screw-worm flies (Chrysomyiini); green-bottle flies (Luciliini); blue-bottle flies (Calliphorini); blow-flies (Calliphorini, *Phormia* and *Protophormia*), and cluster flies (*Pollenia rudis*).

A number of them are of considerable economic importance from medical, veterinary, and sanitary standpoints. Probably all of the species in the larval stage are flesh feeders (chiefly on carrion) though some will also breed in the excrement of carnivorous and omnivorous animals, including man. Certain species attack live stock and at times cause considerable losses in cattle and sheep.

Myiasis in man, occasionally followed by death, occurs not infrequently in some regions, as a result of certain of these flies laying their eggs on wounds or diseased tissue, where the larvae upon hatching can feed on the surrounding parts.

A brief summary is here appended showing the general distribution in America and the larval habits of the groups:

Mesembrinella: Tropical America. Scavengers.

Chrysomyiini: Throughout America. Screw worm flies. All?

Phormia: North America. Carrion; sometimes producing myiasis.

Protophormia: As in *Phormia*.

Boreëllus: Subarctic. Habits unknown.

Protocalliphora: North America. Parasites of nestling birds.

Luciliini: Throughout America. Carrion; some species frequently produce myiasis; some parasitic on toads.

Calliphorini: Chiefly North America, rare in the Andes. Chiefly scavengers, sometimes produce myiasis.

Pollenia: North America. Parasites of earth worms.

Melanodexia: California, Oregon. Habits unknown.

The family Calliphoridae belongs to the higher Muscoid Diptera,¹ a group characterized by the presence of a well-defined row of hypopleural bristles. From the Tachinoidea, which have a well-developed post scutellum and the lateral margins of the tergites usually meeting on the ventral median line of the abdomen, thereby obscuring the sternites, the Sarcophagoidea may be separated by the undeveloped post scutellum (subdeveloped in *Mesembrinella*) and the side edges of the tergites usually well separated, so that sternites two to five, while reduced, usually are distinctly visible.

The Sarcophagidae and Calliphoridae are very closely allied and may eventually be considered as one family. Within the limits of our fauna the two may be differentiated as follows:

SARCOPHAGIDAE: Post humeral bristle usually present and placed mesad of the presutural; usually four notopleurals; propleura and prosternum usually bare; stem vein not ciliated; very rarely with metallic blue or green coloration; usually opaque gray and the abdomen with a checkered appearance.

CALLIPHORIDAE: Post humeral bristle rarely absent and usually placed laterad of the presutural (in Pollininae it may be laterad, in line with or mesad of presutural, or absent); usually two, rarely three (some species of *Protocalliphora*) notopleurals; propleura and prosternum pilose (bare in Polleninae); stem vein ciliated in Chrysomyiinae and *Mesembolia*; usually metallic green, blue or purplish in appearance, opaque gray in Polleninae.

Key to the Subfamilies, Tribes and Genera of American Calliphoridae.

1. Post scutellum rather well developed; bucca very narrow, about one-fifth to one-sixth height of eye; arista plumose to tip; bend of fourth vein obtuse and broadly rounded; metathoracic spiracle as broadly rounded anteriorly as it is posteriorly; disc of squamae bare; stem vein sometimes setose; female usually with a pair of decussate bristles on frontal vitta. (Tropical America).....Subfamily Mesembrinellinae.

Genus *Mesembrinella* Giglio-Tos.

¹(Superfamily Tachinoidea (including Tachinidae and Dexidae) and superfamily Sarcophagoidea (including Sarcophagidae and Calliphoridae).

- Post scutellum undeveloped; bucca subquadrate, about one-half eye height; bend of fourth vein usually strongly angled; metathoracic spiracle tapering anteriorly; female rarely with decussate bristles on frontal vitta.....2.
2. Stem vein on upper side and subcostal sclerite setose.....3.
 Subfamily Phorminae.
 Stem vein bare; subcostal sclerite setose only in *Lucilia caesar* and *Pollenia*.....17.
3. Arista bare. (Chile).....Tribe Trixoneurini.
Trixoneura, new genus.
 Arista distinctly plumose.....4.
4. Stem vein setose below as well as above. (South American, chiefly in the Andes).....Tribe Toxotarsini.....5.
 Stem vein bare below.....9.
5. Hind basitarsus arcuated.....*Toxotarsus* Macquart.
 Hind basitarsus straight.....6.
6. One sublateral; no posterior acrostichals.....*Sarconesia* Bigot.
 Two to three sublaterals; two to three posterior acrostichals.....7.
7. Arista plumose less than half its length; two posterior acrostichals (middle pair absent).....*Chlorobrachycoma* Townsend.
 Arista plumose a little more than half its length; three posterior acrostichals.....8.
8. Large robust flies, 12-18 mm. Male: Eyes widely separated, legs conspicuously hairy; mid-basitarsus enlarged at apex; forceps consolidated into a single style. Female: Front much broader than length of third antennal joint.....*Neta*, new genus.
 Moderate size, 7-10 mm. Male: Eyes closely approximated; legs not hairy; mid-basitarsus not swollen at apex; two well-developed pairs of forceps. Female: Front narrower than length of third antennal joint.....*Sarconesiopsis* Townsend.
9. Face yellow with mostly yellow pile; one post humeral bristle (throughout America).....Tribe Chrysomyiini.....10.
 Face black with black hairs; lower squama bare; usually two post humerals.....Tribe Phormini.....14.
10. Lower squama partly pilose on outer as well as basal half. (Chiefly eastern hemisphere, one species in America).....*Chrysomyia* R.-Desvoidy.
 Lower squama bare on outer half.....11.
11. Lower squama with distinct hairs on basal portion; mesonotum strongly vittate; dorsocentrals 0:1 or 0:2; disc of upper squama in female with distinct hairs.....12.
 Lower squama bare or faintly pubescent on basal portion; mesonotum without distinct vittae; dorsocentrals 2:4; disc of upper squama of female bare.....13.
12. Palpi short and slender.....*Cochliomyia* Townsend.
 Palpi normal, clavate.....*Paralucilia* Brauer and Bergenstamm.
13. Vibrissae at oral margin, hardly approximated.....*Hemilucilia* Brauer.
 Vibrissae at least length of second antennal joint above oral margin.....
Chloroprocta Van der Wulp.

14. Anterior acrostichals not distinct from surrounding hairs; squamae darkened; outer portion of disc of upper squama thinly haired.....15.
 Anterior acrostichals well differentiated from surrounding hairs; squamae rarely darkened.....16.
15. Head strongly triangular in frontal aspect; arista thickened and with short appressed rays; prothoracic spiracle much larger than third antennal joint.....*Boreöllus* Aldrich and Shannon.
 Head very obtusely triangular; arista and aristal rays normal; prothoracic spiracle about size of third joint.....*Protophormia* Townsend.
16. Four anterior dorsocentrals; prothoracic spiracle distinctly light orange; opaque area (outer portion) of upper squama thinly haired.....
Phormia R.-Desvoidy.
 Three anterior dorsocentrals; prothoracic spiracle dark orange to black; upper squama without hairs on upper surface.....*Protocalliphora* Hough.
17. Prosternum and propleura pilose; more or less metallic green to blue to purple; pilosity of parafacials not extending down as far as lowermost margin of eye.....Subfamily Calliphorinae.....18.
 Prosternum and propleura bare; without evident blue, green or purple reflections, abdomen usually tessellated in appearance; parafacials pilose as far down as lowermost eye margin. (North America).
 Subfamily Polleniinae.....22.
18. Parasquamal tuft present; lower squama bare. (Throughout America).
 Tribe Luciliini.....19.
 Without a parasquamal patch of hairs; lower squama with distinct hairs. (Chiefly North America, rare in Andes).....Tribe Calliphorini.....20.
19. Very large robust species, 18-20 mm.; no anterior acrostichals; one sublateral.....*Blepharicnema* Macquart.
 Moderate in size, 6-12 mm.....*Lucilia* R.-Desvoidy.
20. One sublateral; two bristles near middle on exterior surface of fore tibia; two post acrostichals.....*Cynomyia* R.-Desvoidy.
 Two or three sublaterals; usually one bristle on¹ exterior surface of fore tibia; three post acrostichals.....21.
21. Antenna of normal size, third joint longer than length of dorsal bristle on second joint; section of costa between auxiliary and first veins longer than section between tips of second and fourth veins; last section of fourth vein (apical crossvein) usually with a decided bend.....
Steringomyia Pokorny and *Calliphora* R.-Desvoidy.
 Antenna black, small, third joint only as long as dorsal bristle on second joint; section of costa between auxiliary and first veins distinctly shorter than section between second and fourth veins; last section of fourth vein straight or but gently curved.....*Onesia* R.-Desvoidy.
22. Lower squama broader than long, the mesal margin in contact with metanotum; anterior mesonotal bristles: 2 acrostichals; 2 dorsocentrals; 2 sublaterals; one post humeral; one presutural; thorax, in fresh condition, clothed with deciduous yellow pile.....*Pollenia* R.-Desvoidy.

¹The European genus *Melinda* R.-Desvoidy, which may eventually be reported from America, has the squamae bare.

Lower squama a little longer than broad, the mesal margin well separated from thorax; presutural bristles: 2 acrostichals; 2 dorsocentrals; 1 sublateral; no post humeral; 1 presutural; thorax without yellow pile
Melanodexia Williston.

Key to species of Mesembrinella (from Aldrich, 1925).

1. Stem vein bare (subgenus *Mesembrinella*).....2.
 Stem vein ciliated (subgenus *Mesembolia* Aldrich).....20.
2. Two presutural bristles.....3.
 One presutural.....7.
3. Legs almost black, but middle and hind femora yellow on apical half...4.
 Femora and tibia yellow.....5.
4. Wing with heavy subcostal black stripe not reaching third vein, posterior portion paler; three posterior acrostichals (Bolivia, Surinam).....
brunnipes Surcouf.
 Wing deep brown, the second fourth, except behind yellow (Bolivia)....
pictipennis Aldrich.
5. Apical cell very wide open, the included costal section more than half as long as preceding one (Costa Rica, Ecuador).....*umbrosa* Aldrich.
 Apical cell less widely opened, included costal section less than half the preceding one.....6.
6. Wing with diffuse and not very strong infuscation (wide spread Neotropical).....*bicolor* (Fabricius).
 Wing with heavy subcostal stripe, beyond middle, before third vein (Brazil).....*batesi* Aldrich.
7. Fourth abdominal segment with discal row of bristles.....8.
 Fourth segment without discals.....13.
8. Femora, pleurae and abdomen blue-green or blackish; 2 pairs of acrostichals before suture.....9.
 Femora, pleurae and base of abdomen yellow.....10.
9. Discal scutellar bristles small, almost in line with the much larger basal lateral pair; female with but one pair of proclinate orbitals, which are almost in the frontal row (Costa Rica).....*uniseta* Aldrich.
 Discal scutellars but little smaller than lateral basal pair, and forming with them a strong curve; female with two pairs of orbitals, just outside frontal row, which is here very hairlike (Peru)....*cruciata* (Townsend).
10. One pair anterior acrostichals.....11.
 No anterior acrostichals.....12.
11. One post humeral (Panama).....*tibialis* Aldrich.
 Two post humerals (South America).....*aeneiventris* (Wiedemann).
12. Mesonotum, rear view, showing three dark stripes, separating four pollinose ones (Brazil).....*purpurata* Aldrich.
 Viewed from behind, the pollen is not distinctly divided into four stripes (Costa Rica).....*semiflava* Aldrich.
13. Facial ridges high and sharp, hairy to middle; middle and hind tibiae not infuscated; sternopleurals 2:1.....*facialis* Aldrich.
 Facial ridges lower, not hairy except close to vibrissae.....14.

14. With one or 2 pairs anterior acrostichals.....15.
 Without anterior acrostichals.....17.
15. Legs, pleurae and base of abdomen largely yellow.....16.
 Legs, thorax and abdomen blue-green or blackish; fifth sternite of male
 produced into two shining black styles (Costa Rica).....
spicata Aldrich.
16. Second to fourth abdominal segments with posterior sharply defined
 violet band; third segment without marginal bristles (Brazil).....
cyaneicincta Surcouf.
 Second to fourth segments not banded with violet; third segment with
 row of marginals (Costa Rica).....*flavicurva* Aldrich.
17. One intra-alar (posterior); abdominal segments 2-4 with sharply defined
 posterior violet bands (Brazil).....*pauciseta* Aldrich.
 Two intra-alars; abdomen not violet banded.....18.
18. Second abdominal segment with weak hairs along hind margin (South
 America).....*randa* (Walker).
 Second segment with distinct row of marginals.....19.
19. Mid and hind tibiae black, in male the middle ones elongated and with
 minute bristles (South America).....*quadrilineata* (Fabricius).
 Mid and hind tibiae not or hardly infuscated; male with the usual bristles
 or mid tibia (Brazil).....*dorsimacula* Aldrich.
20. Greatest width of apical cell exceeding length of hind crossvein.....21.
 Greatest width of apical cell less than hind crossvein (Brazil).....
peregina Aldrich.
21. Apical cell moderately wide open, the included costal segment not more
 than half of preceding one; no acrostichals immediately behind suture
 (Mexico to Paraguay).....*bellardiana* Aldrich.
 Apical cell very wide open, included costal section more than half of
 preceding (Brazil).....*fulvipes* Aldrich.

Tribe TRIXONEURINI.

Genus **TRIXONEURA**, new genus.

Genotype.—*Agria fuscipennis* Macquart.

Trixoneura fuscipennis (Macquart).

Agria fuscipennis Macquart, Dipt. Exot., vol. 2, pt. 3, 1841, p. 109.

This tribe, genus and species constitute a very aberrant one for the Calliphoridae. The species, presumably the type specimen (female), was examined by the writer in the Paris Museum, and was found to have the following characters: Arista bare; hairs on upper part of head very stiff and bristly; no sublaterals; one post humeral; post alar declivity with few setae; metasternum with strong hairs; stem vein coarse setose; subcostal sclerite with few setae; first posterior cell closed; no post scutellum. In general appearance the fly is rather small, with something of a Sarcophagid aspect.

Another specimen, also female, was found in the same collection placed with *Toxotarsus rufipalpus* Macquart.

Distribution.—Chile (type locality).

Tribe TOXOTARSINI.

The Toxotarsini appear to be peculiar to South America and are largely restricted to the Andean region. Several genera are known, but in each case they are monotypic. The tribe is characterized by the stem vein being setose above and below; subcostal sclerite setose; squamae bare; a tuft of hairs present in the interior angle of the squamae; parafacials setose; macrochaetae strongly developed on head and thorax; sternopleurals 1:1. In general appearance they resemble the genera *Cynomyia* and *Calliphora*. The group heretofore has been considered under the Sarcophagidae as certain members have the arista plumose only half way. A number of characters such as the presence of only two notopleurals, the post humeral being placed laterad of the presutural and the setose stem vein definitely allies the tribe to the Calliphoridae.

The genus and species, *Chloronesia andina* Townsend,¹ which has also been associated with the genera of this tribe, proves to be a true Sarcophagid.

Toxotarsus rufipalpis Macquart.

Toxotarsus rufipalpis Macquart, Dipt. Exot. Supp., vol. 4, 1851, p. 238, pl. 22, fig. 3.

This genus and species was described by Macquart as having the hind basitarsus arcuated. The writer saw the type in the Paris Museum, but not knowing the character of the hind basitarsus failed to look for it, and took it to be *Sarconesia chlorogaster*. Specimens of *S. chlorogaster*, now before me, males and females, have the hind metatarsus straight. Due to this difference, it seems advisable to consider the two as separate genera and species.

Distribution.—Chile (type locality).

Sarconesia chlorogaster (Wiedemann).

Sarconesia Bigot, An. Soc. Ent. France, ser. 3, vol. 5, 1857, p. 301.

Genotype.—*Sarcophaga chlorogaster* Wiedemann, Aus. Zweifl., vol. 1830, p. 359.

This species bears a strong superficial resemblance to the genus *Sarcophaga* except for its metallic blue abdomen.

Distribution.—Peru, Chile, Argentina, Paraguay.

¹Townsend, Proc. U. S. Nat. Museum, vol. 43, 1912, pp. 360-361.

Chlorobrachycoma splendida Townsend.

Chlorobrachycoma Townsend, Ins. Ins. Mens., vol. 6, 1918, p. 155.

Genotype.—*splendida* Townsend, *ibid*.

Only a single specimen, a female, is known of this genus and species. It is about the size and appearance of *S. chilensis*, but the pollinose mesonotal stripes are less distinct and the metallic greenish blue color is very pronounced.

Distribution.—Oroya, Peru, 12,000 feet (May 8, 1914, C. H. Townsend).

Genus **SARCONESIOPSIS** Townsend.

Sarconesiopsis Townsend, Ins. Ins. Mens., vol. 6, 1918, p. 156.

Genotype.—*Calliphora chilensis* Macquart.

Sarconesiopsis chilensis (Macquart).

Calliphora chilensis Macquart, Dipt. Exot., vol. 2, 1841, p. 131.

? *Cynomyia fuscipennis* Macquart, *ibid.*, p. 110.

Musca incerta Walker, Dipt. Saunders, 1856, p. 334.

Sarconesiopsis caerulea Townsend, Ins. Ins. Mens., vol. 6, 1918, p. 156.

Appears to be a common species in Peru and Chile, forty-six specimens at hand. The male has unusually dark wings, while in the female the wings are clear.

Distribution.—Chile (type locality), Peru, Colombia.

NETA, new genus.

Genotype.—*Phryssopoda splendens* Macquart.

Neta splendens (Macquart).

Phryssopoda splendens Macquart, Dipt. Exot., vol. 4, 1851, p. 204.

Calliphora peruviana Macquart, *ibid.*, p. 243.

Calliphora magellanica Macquart, Dipt. Exot., vol. 2, 1841, p. 131.

Sarcophaga ortogesa Walker, List, 1849, p. 834.

Musca chilensis Walker, *Nomen nuda*?

Calliphora paytensis Townsend, Ann. New York Acad. Sci., vol. 7, 1892, p. 36.

The types of all the above (Townsend's name was proposed for *peruviana* as it was preoccupied) have been examined by the writer, who found that they constitute but one species.

A very large and striking species, presenting several peculiar characters in the male; that of the single style in place of the four which are usually present, is particularly remarkable.

Distribution.—Bolivia (type locality), Peru, Chile.

Tribe CHRYSOMYIINI.

Genus COCHLIOMYIA Townsend.

This genus, at first monotypic (type, *macellaria* Fabricius), had a second species, namely, *Musca laniaria* Wiedmann, assigned to it by Aldrich (1925). A third species, new, has been found in the National Museum collection and is here added.

Key to species of Cochliomyia Townsend.

1. No upper frontal bristles present in male.....2.
A distinct pair of upper frontal bristles present in male; tip of abdomen coppery, the first three tergites very dark green; thorax dark, the four pale stripes more slender than in *macellaria* or *laniaria*, the inner ones scarcely continued onto scutellum (St. Domingo).....*minima*, new species.
2. Tip of abdomen colored the same as the preceding part; thorax evidently metallic blue or green, with four white pollinose stripes, the inner not continued onto scutellum (wide spread throughout warmer parts of America).....*macellaria* (Fabricius).
Tip of abdomen coppery or with violet reflections, in strong contrast to the rather dark preceding portion; thorax black with only slight traces of metallic color, the four white pollinose stripes distinct and the inner pair continued onto scutellum. (Florida, West Indies).....
laniaria (Wiedemann).

Cochliomyia minima, new species.

Male.—Differs from *macellaria* and *laniaria* by the smaller size; broader front which is one and one-half times the width of parafacial; presence of a distinct pair of upper frontal bristles; the deeply set facial plate which rather sharply rises to the frontal oral margin; the oral vibrissae nearer to the oral margin, being scarcely the length of the second antennal joint above the margin; palpus nearly the length of third antennal joint; the narrower mesonotal stripes (legs very dark brown); dorsum of tergites one, two, three and most of fourth very dark and nearly opaque, the sides of the third and fourth segments with a pollinose spot, on the latter a faint transverse pollinose stripe connects the spots; fifth tergite a fiery copper color; hypopygium and forceps yellowish, the forceps much shorter and stouter and the penis very much longer, its length nearly equal to length of hind tibia; wings subhyaline, darker basally; squamae darkened; halteres brownish yellow.

Female.—Agrees with the male externally except in the front, which is, however, normal for the sex and shows very little difference from the front of the other two species.

Described from two males and one female.

Type locality.—San Francisco Mountains, St. Domingo, West Indies (September 15, A. Busck).

Type.—Cat. No. 28,886, U. S. N. M.

Genus **HEMILUCILIA** Brauer.

Table of Species.

1. Anterior part of thorax more or less yellow; base of abdomen, dorsal view, partly yellow.....2.
 Thorax entirely metallic green or blue; dorsum of abdomen entirely dark. Male: Eyes contiguous, no fronto-orbital bristles. Female: Front less than twice as long as wide, black on upper two-thirds. (Brazil, Panama, Costa Rica, Mexico).....*fuscanipennis* (Macquart)
2. Second tergite entirely dark. Male: Eyes contiguous, no fronto-orbital bristles. Female: Front more than twice as long as wide, dark only above. (Costa Rica, Panama, Brazil, Paraguay).....
segmentaria (Fabricius).
- Second tergite largely yellow.....3.
3. Male: Eyes separated by width greater than parafacial; upper pair of fronto-orbitals present. Female: Length of front less than twice the width, shining black on upper two-thirds; length 6.5 mm. (Venezuela, Brazil).....*parva*, new species.
 Male: Unknown. Female: Length of front nearly three times its width, black only on vertex; length 8 mm. (Peru)....*townsendia*, new species.

Hemilucilia segmentaria (Fabricius).

A moderate sized species, dark blue, with anterior part of thorax and abdomen yellowish.

Distribution.—Apparently widespread in tropical America. South America (type locality), Brazil, Venezuela, Panama, Costa Rica.

Hemilucilia townsendi, new species.

Less robust than *segmentaria*; thorax metallic green, yellowish anteriorly, with faint pollinose stripes on mesonotum; first and second tergites yellow, the latter with a hind border of dark blue which extends forward as a median stripe to the anterior margin of the tergite; apical half of wing smoky, especially on anterior border.

One female.

Type locality.—Yahuar mayo, Peru (February 11, 1910, C. H. T. Townsend).

Type.—Cat. No. 28,887, U. S. N. M.

Named in honor of Dr. C. H. Tyler Townsend.

Hemilucilia parva, new species.

Noticeably smaller than its congeners, thorax light metallic green, the anterior portion yellowish; first tergite yellow, second yellow anteriorly, darkened on hind border with a median anteriorly directed projection from the darkened portion. Eyes well separated in the male, the upper pair of fronto-orbitals present.

One male, one female.

Type locality.—"Amazon," Brazil (H. W. Bates).

Allotype locality.—Quebrada Secca, Venezuela.

Type.—In British Museum.

Allotype.—Cat. No. 28,888, U. S. N. M.

Hemilucilia fuscanipennis (Macquart).

Similar to *segmentaria* but entirely bluish black and lacking the yellow on the thorax and the base of the abdomen dorsally, which, however, may be very obscurely yellow.

Distribution.—Tropical America. Bahia, Brazil (type locality); Panama, Costa Rica, Mexico.

Genus **CHRYSOMYIA** Robineau-Desvoidy.

Chrysomyia desvoidyi Hough.

Only one species, *C. desvoidyi* Hough, is known for this genus in the Western Hemisphere. The genus is essentially an Old World group and is characterized by having the lower squama pilose on the outer half as well as in the basal hollow. *C. desvoidyi* has only the mesal portion of the outer half of the lower squama pilose.

Distribution.—Mexico, Venezuela, Panama, Costa Rica.

Genus **CHLOROPROCTA** Van der Wulp.

Table of Species.

Thorax, except dorsum, and abdomen more or less yellowish; eyes of male with conspicuously enlarged facets above.....*semiviridis* Van der Wulp.
Thorax, etc., entirely dark metallic bluish green; eye facets of male nearly uniform throughout.....*idioidea* R.-Desvoidy.

Chloroprocta semiviridis Van der Wulp.

The two species given in the above key belong to the genus *Chloroprocta* as defined by Aldrich. The yellowish color in *semiviridis* is variable, a female from Costa Rica shows very little trace of yellow.

Distribution.—Yucatan (type locality); Costa Rica; Mexico; Texas.

Chloroprocta idioidea (Robineau-Desvoidy).

Chrysomyia idioidea Robineau-Desvoidy, Myodaires, 1830, p. 445 (type examined).

Musca purpureae Walker, Dipt. Saund., 1856, p. 337 (type examined).

One female from Para, Brazil, and three from Bartica, British Guiana, agree with the types of both *idioidea* and *purpureae*.

Type locality.—South America (for both *idioidea* and *purpureae*).

Genus **PARALUCILIA** Brauer and Bergenstamm.

Table of Species.

- Length of antenna much less than height of bucca, or, in female, than width of front. (Southern United States to Argentina and Chile).....
affinis R.-Desvoidy.
- Length of antenna slightly longer than height of bucca and distinctly longer than width of front of female. (Brazil).....*viridula* R.-Desvoidy.

Paralucilia viridula (Robineau-Desvoidy.)

Chrysomyia viridula Robineau-Desvoidy, Myodaires, 1830, p. 445.

Type not seen in the Paris Museum.

One female at hand, which is apparently very distinct from the following species, agrees very closely with the description of *viridula* and is therefore considered to be conspecific with it. In addition to the much narrower front, larger antennae and smaller bucca it possesses the following mesonotal bristles which are absent in *affinis*. Three anterior dorsocentrals (sometimes one in *affinis*); two sublaterals; four posterior dorsocentrals (two in *affinis*).

Distribution.—Brazil (type locality); Sao Paulo, Brazil (A. Lutz).

Paralucilia affinis (Robineau-Desvoidy).

Chrysomyia affinis Robineau-Desvoidy, Myodaires, 1830, p. 445.

Chrysomyia fulvicrura R.-D., *ibid*, p. 446 (type examined).

Calliphora peruviana R.-D., *ibid*, p. 438.

Calliphora fulvipes Macquart,¹ *Diptera Exotique*, vol. 2, pt. 3, 1843, p. 132 (type? examined).

Lucilia durvillei Macquart, *ibid*, p. 142 (type examined).

Calliphora annulipes Philippi, *Zeitschr. Ges. Naturw.*, vol. 17, 1865, p. 514.

The above list of synonyms is quite sure to be only an incomplete one as it contains only those of which the writer is reasonably certain. Many of the names listed under *Lucilia*, *Chrysomyia* and *Sonomyia* in Townsend's catalogue of South American Muscidae will very likely prove to be synonyms of either this species or *Cochliomyia macellaria*.

¹A specimen in the Paris Museum is presumably the type of this species, as it bears a label, "en Cat. du Mus. Gayi." This same specimen, however, bears the name label "*C. rufipes*" which Macquart had previously used for a species he described from Java.

It may be assumed that Macquart at the time of describing it noticed that the name *rufipes* was preoccupied and changed the name to *fulvipes* in the description but did not change the name label on the specimen.

Distribution.—Brazil (type locality) and throughout South America in general and extending into the southern United States.

Tribe PHORMIINI.

Phormia regina (Meigen).

Distribution.—Mexico, throughout United States, rather rare in Canada and Alaska.

Protophormia terraenovae (Robineau-Desvoidy).

Distribution.—About the same range as above but more abundant in the North and less numerous southward.

Boreellus atriceps (Zetterstedt).

Boreëllus aristatus Aldrich and Shannon, Ins. Ins. Mens., vol. 11, 1923, p. 107.

Distribution.—Boreal America and Europe.

Genus **PROTOCOLLIPHORA** Hough.*Key to Males of Protocalliphora.*

1. Narrowest width of front equal to length of third antennal joint; outer forceps subquadrate, less than twice as long as broad (*avium*, sens. lat.).....2.
- Narrowest width of front distinctly less than length of third antennal joint; outer forceps elongate, three to four times as long as broad.....3.
2. Hairs on mesonotum one-fourth length of bristles; basicosta black (New York).....variety *avium* S. & D.
- Hairs on mesonotum nearly half as long as bristles; basicosta orange (Washington).....variety *asiovora* S. & D.
3. Parafrontals contiguous (always?).....(*hirudo*, sens. lat.).....4.
- Parafrontals well separated.....(*splendida*, sens. lat.).....5.
4. Three notopleurals (Colorado).....variety *hirudo* S. & D.
- Two notopleurals (Kansas).....variety *parva* S. & D.
5. Dark metallic blue; pollinose stripes on mesonotal disc faint.....6.
- Body with a grayish tinge; pollinose stripes evident on disc of mesonotum (Washington).....subspecies *hirundo* S. & D.
6. Squamae white (throughout U. S.).....variety *splendida* Macquart.
- Squamae darkened (Washington, British Columbia).....variety *hesperia* S. & D.

Key to Females of Protocalliphora.

1. Large species (11 mm.); parafacials broad, opposite second antennal joint equal in width to distance between oral vibrissae; basicosta dark brown.....(*avium*, sens. lat.).....2.
- Smaller (9 mm. or less); parafacials usually narrower, opposite second antennal joint equal to one-half distance between oral vibrissae; if as broad as in *avium* then basicosta orange.....3.

- Body usually more evidently coppery; metasternum bare; lobes of fifth sternite prominent with dense long hairs. (Cosmopolitan.) (*argyri-cephala* Macquart; *palescens* Shannon) *cuprina* (Wiedemann).
7. Subcostal sclerite setose; back of head mostly black setose; basicosta black; propleura black setose (North America, i. e., boreal and transitional zones and high altitudes in southern states)..... *caesar* (Linnaeus).
Subcostal sclerite faintly pubescent8.
8. Hind margin of second and third and entire surface of fourth tergites with long, erect bristles; back of head entirely with stiff black setae; propleural pile and basicosta black; lobes of fifth sternite conspicuous (Washington)..... *elongata* Shannon.
Abdomen not conspicuously bristly; back of head with pale soft pile....9.
9. Parafrontals bristly only on lower half, contiguous and of less width than parafacial; propleura pale pilose; basicosta dark brown10.
Parafrontals bristly on more than lower half.....11.
10. Eye facets, on large front area, greatly enlarged; parafrontals reduced to slender line of less width than one of adjoining facets; prä- and metathoracic spiracles greatly enlarged; general body color purplish; squamae darkened. (Costa Rica, Mexico)..... *ocularis*, new species.
Eye facets moderately enlarged; parafrontals distinctly broader than width of facet; thoracic spiracles moderately enlarged; general body color dark bluish green; squamae moderately infuscated.....
rica, new species.
11. Propleura black pilose; parafrontals contiguous, bristly on entire length, a pair of upper frontal bristles present; basicosta dark brown; forceps with short sparse pile. (Texas, New Mexico, Arizona)
unicolor Townsend.
Propleura pale pilose.....12.
12. Parafrontals bristly on lower three-fourths, no upper frontals present; basicosta dark brown; forceps with rather dense long pile13.
Parafrontals with a pair of upper frontal bristles; inner forceps not distinctly hairy.....14.
13. Face very sparsely pilose; general color strongly purple. (Peru)
ibis, new species.
Face normally pilose; general color strongly green. (Texas, Mexico, Costa Rica, Panama)..... *hirtiforceps*, new species.
14. Parafrontals contiguous; beard black; basicosta more or less yellow. (Southeastern United States)..... *australis* Townsend.
Parafrontals distinctly separated; beard largely yellowish; basicosta yellow. (Southeastern United States and West Indies).....
cluvia (Walker).

Table of Females of Lucilia.

1. Two sublaterals; two exterior bristles on fore tibia. (Subgenus *Francilia*)..... *alaskensis* Shannon.
Three sublaterals; one exterior bristle. (Subgenus *Lucilia*).....2.
2. Three posterior acrostichals3.

- Two posterior acrostichals6.
- 3. Basicosta black; palpi brownish.....*sylvarum* (Meigen).
Basicosta and palpi yellow.....4.
- 4. Body without evident pruinosity; third antennal joint broader than
width of parafacial.....*thaluna*, new species.
Body with distinct pruinosity; parafacial broader than width of third
antennal joint.....5.
- 5. Body more evidently green; metasternum pilose.....*sericata* (Meigen).
Body more evidently coppery; metasternum bare.....*cuprina* (Weidemann).
- 6. Subcostal sclerite setose; basicosta black.....*caesar* (Linnaeus).
Subcostal sclerite faintly pubescent.....7.
- 7. Tergites three, four and five with strong, erect bristles; basicosta black;
back of head entirely black setose.....*elongata* Shannon.
- 8. Tergites three, four and five not conspicuously bristly.....9.
- 9. Propleura black pilose; basicosta dark brown; front and face dark.....
unicolor Townsend.
Propleura pale pilose10.
- 10. Antennae bright reddish yellow (Santa Marta, Colombia).....
ruficornis Macquart.
Antennae not bright reddish yellow.....11.
- 11. Bases of wings strongly darkened; body color purplish.....
ocularis, new species.
Bases of wings not strongly darkened.....12.
- 12. Beard largely pale.....13.
Beard entirely black.....14.
- 13. Front as broad as length of third antennal joint.....*cluvia* (Walker).
Front not as broad as length of third joint.....*rica*, new species.
- 14. Basicosta more or less yellow.....*australis* Townsend.
Basicosta dark brown (Face yellowish. Contrast with face dark in
unicolor).....*hirtiforceps*, new species.

VIRIDINSULA, new subgenus.

Genotype.—*Lucilia pionia* Walker.

This new subgenus is known only in the male and the genotype has only been recorded from the Galapagos Islands.

Subgenus **LUCILIA** R.-Desvoidy.

Lucilia cuprina (Wiedemann).

This species has been recorded from America under the names *Lucilia pallescens* Shannon and *Lucilia argyricephala* Macquart (Shannon, Proc. Ent. Soc. Washington, 1925). Recently Patton (Bull. Ent. Research, 1925) has shown that *argyricephala* Macquart is synonymous with *cuprina* (Wiedemann).

Evidently *L. cuprina* is well established as a cosmopolitan species. It is apparently indigenous to Southern Asia and

parts of Africa. Specimens in the National Collection are from Michigan, District of Columbia, North Carolina, Texas, Brazil, Hawaii, Australia, Asia and Africa.

Lucilia thatuna, new species.

Male and female.—Parafrontals of male contiguous; front of female of moderate width; three posterior acrostichals; back of head partly black setose; propleura black setose; palpi and basicosta yellow; pruinosity of body barely perceptible.

Two males, three females.

Type locality.—Moscow Mountains, Idaho (July 20, 1924, J. M. Aldrich).

Type.—Male, Cat. No. 28,889, U. S. N. M.

Lucilia oculatis, new species.

Male and female.—Fairly large species of a deep purplish color and characterized by an area of very large facets, particularly in the male, on a large frontal portion of the eye. Parafrontals of male contiguous and greatly reduced so that at their narrowest portion the two together appear to be a slender line of less width than one of the adjoining facets and setose only on lower half; propleura pale pilose; two posterior acrostichals; pro- and metathoracic spiracles greatly enlarged; bases of wings and squamae darkened.

Three males, two females.

Type locality.—Higuito, San Mateo, Costa Rica (Pablo Schild).

Allotype locality.—Juan Vinas, Costa Rica (Pablo Schild); also from Mexico (J. R. Inda).

Type.—Cat. No. 28,890, U. S. N. M.

Lucilia rica, new species.

Male and female.—Rather small species with eyes facets and thoracic spiracles moderately enlarged, general body color bluish green; parafrontals of male bristly only on lower half and their combined width at the narrowest portion distinctly broader than width of adjoining eye facet; hind region of lower surface of head pale pilose; two posterior acrostichals; squamae moderately infuscated. Front of female not as broad as length of third antennal joint.

Two males, three females.

Type and allotype localities.—Antigua, West Indies (1924, H. Goodwin); also one paratype from Mayaguez, Porto Rico (March 14, 1914, R. H. Van Zwalenburg).

Type.—Cat. No. 29,145, U. S. N. M.

Lucilia ibis, new species.

Male.—Rather small species of a deep purplish color. The very sparsely pilose face and the rather densely and long haired forceps serve to identify it.

Two males.

Type locality.—Huadquina, 5,000 feet, Peru (August, 1911, Yale Peruvian Expedition).

Type.—Cat. No. 28,891, U. S. N. M.

Lucilia hirtiforceps, new species.

Male and female.—Closely allied to *L. australis* and *unicolor*. A moderate sized species of a deep green coloration; parafrontals of male subcontiguous, setose on lower three-fourths and without a pair of upper frontal bristles; face yellowish; two posterior acrostichals; propleura pale pilose; basicosta dark brown.

Five males, six females. Type male and allotype female taken in copula.

Type locality.—Ancon, Canal Zone (June 1, 1921, J. Zetek); also from Taboga Island, Panama; Costa Rica; San Salvador; Colima, Mexico; Victoria, Texas.

Type.—Cat. No. 28,892, U. S. N. M.

Lucilia cluvia (Walker).

Synonym.—*Lucilia pilatei* Hough.

The synonymy is based upon an examination of the type made by the writer in the British Museum. A fairly common species in the West Indies and southeastern United States.

Lucilia unicolor Townsend.

Synonym.—*Lucilia infuscata* Townsend.

In the writer's previous treatment of the Luciliini (1924) this species was stated to be possibly distinct from *auctralis* Townsend. Additional material now shows it to be a different species.

Table of Species of Cynomyia.

Head as high as broad and mostly bright orange yellow (east and west coasts of northern North America).....	<i>mortuorum</i> (Linnaeus).
Head broader than high, largely blackish, lower portion partly reddish brown (throughout North America).....	<i>cadaverina</i> R.-Desvoidy.

Cynomyia flavipalpis Macquart.

This species was described from America and reported from New Hampshire by Johnson (determination by Coquillett). It may prove to be a species of *Steringomyia*. Species not seen.

Table of Species of *Steringomyia* and *Calliphora*.

1. Two sublaterals; two intra-laterals; males with lobes of fifth sternite prominent, obtusely rounded apically. (See note below on <i>S. montana</i>).....	2.
Three sublaterals.....	4.
2. Squamae white.....	3.
Squamae darkened (Colorado, 10,240 feet altitude; Alaska).....	
<i>S. aldrichi</i> Shannon.	
3. Arista short plumose (Alaska).....	<i>S. popoffana</i> (Townsend).
Arista with normal plumosity (Colorado, 10,240 feet altitude; Alaska)....	
<i>S. alpina</i> (Zetterstedt).	
4. Front of head largely bright golden; squamae white; basicosta yellow; two costal spines; front of male broad with pair of upper frontals (plains region of western North America).....	<i>C. elongata</i> (Hough).
Front of head not conspicuously bright yellow; squamae darkened.....	5.
5. A strongly differentiated pair of secondary ocellars placed immediately behind ocelli; bristles on facial ridges well developed; front of male broad, the parafrontals with strong, long bristles on entire length. (Western North America).....	<i>latifrons</i> Hough.
Secondary ocellars hardly differentiated from surrounding hairs; facial ridge bristles much smaller.....	6.
6. Two intra-alars.....	7.
Three intra-alars.....	13.
7. Bucca red; basicosta yellow, or yellowish-brown. (Very wide spread in North America).....	<i>C. erythrocephala</i> (Meigen).
Bucca black; basicosta black.....	8.
8. Head as broad as high; gena (below parafacial) normally black.....	9.
Head broader than high; gena reddish brown.....	10.
9. Distance between wing margin and angle of fourth vein less than preangular section of fourth vein; forceps of male very similar to those of <i>C. viridescens</i> (Alaska).....	<i>C. morticia</i> Shannon.
Distance between wing margin and angle of fourth vein greater than preangular section of fourth vein.....	9a.
9a. Forceps of male broadly pear-shaped in outline.....	<i>S. alaskensis</i> Shannon.
Forceps of male distinctly more slender, similar to those of <i>S. aldrichi</i>	
<i>Steringomyia montana</i> , new species.	
10. Bases of wings blackish.....	11.
Bases of wings not strongly darkened.....	12.
11. Male: Narrowest width of front equal to distance between hind ocelli. Female: Width of parafacial about equal to length of arisal rays (Mexico, Colombia?) (Synonym.— <i>C. irazuana</i> Townsend).....	
<i>C. nigribasis</i> Macquart.	
Male: Narrowest width of front distinctly wider than distance between hind ocelli. Female: Width of parafacial much greater than length of arisal rays (Peru).....	<i>C. peruviana</i> R.-Desvoidy.
12. Beard reddish (North America).....	<i>vomitaria vomitaria</i> (Linnaeus).
Beard black (northern North America).....	<i>vomitaria nigribarba</i> Shannon.

13. Bucca red; third antennal joint of female rather small, the length equal to distance between rows of frontal bristles (western United States)....
coloradensis Hough.
 Bucca black; third antennal joint of female rather large, the length greater than distance between rows of frontals (eastern and northern North America)*viridescens* R.-Desvoidy.

***Steringomyia montana*, new species.**

Male and female.—This species is intermediate between the genera *Calliphora* and *Steringomyia*. It seems to be closely related to *C. morticia* on the one hand and to *S. alaskensis* (also an intermediate form between the two genera) and *S. aldrichi* on the other. The genitalia of the males of *montana* and *alaskensis*, including the prominent lobes of the fifth tergite, are more typically those of *Steringomyia* and the difference in the wing venation, as stated in the key and which appears to be characteristic of *Steringomyia*, is shared by both. For these reasons *montana* and *alaskensis* are retained in *Steringomyia*, even though they possess three sublaterals. The differences between the species are very slight especially in the females. Two females at hand from the same locality as the male of *montana* are here considered to belong to the same species as the male, but one female from Alaska and two from Mount Ranier, Washington, may be either *montana* or *alaskensis* and for the time being are not assigned to either species. The forceps of the male show distinct differences. In *alaskensis* the four together present a broad pear-shaped outline. In *montana* they are much slenderer and very similar to those of *aldrichi* (see figures in Shannon's paper, 1923).

One male, two females.

Type and allotype locality.—Edmonton, Alberta (August 19, 1923, E. H. Strickland).

Type.—Cat. No. 28,895, U. S. N. M.

Tribe POLLENINI.

Two North American genera are included in the Pollenini: *Pollenia* Desvoidy and *Melanodexia* Williston.

The tribe Pollenini differs considerably from the other North American Calliphoridae. The species are without metallic blue or green coloration, but usually have a dull grayish or blackish appearance, the abdomen sometimes is shining black but usually has a pollinose checkered pattern similar to that of the Sarcophagidae. Facial carina usually present; antennae rather small; facialae distinctly convergent below; oral vibrissae approximated and situated well above oral margin; posthumeral bristle variable, may be absent (*Melanodexia*) or present and placed laterad, in line with or mesad of the presutural; sternopleurals 1:1; metasternum, prosternum and propleuræ bare; parafacials hairy down to lowermost margin of eye; squamal disc bare; tympanic membrane bare.

Two genera of the Sarcophagidae, *Morinia* Desvoidy (European) and *Neophyto* Townsend (North American) seem to possess considerable in common with the Polleniini.

Genus **POLLENIA** Desvoidy.

Four species of *Pollenia* (including *Nitellia*) have been reported from North America. Of these, only *P. rudis* (Fabricius) seems to be well known and established in this country. *Pollenia* (*Nitellia*) *glabricula* (Bigot), described from California, has not been recorded since it was first described. An examination of the type may show it to belong to the genus *Melanodexia*. *Pollenia obscura* Bigot, described from North America, likewise has not been recorded since its original discovery.

Pollenia vespillo Fabricius.

Pollenia (*Nitellia*) *vespillo* (Fabricius), a well-known European species, has been reported from Nova Scotia by Walker and its occurrence in North America was confirmed by Hough. Aside from these records nothing is known of this species in America. It may be immediately distinguished from *P. rudis* by the almost entirely shining black abdomen, only a very faint and uniform pollinosity being present.

Pollenia rudis (Fabricius).

P. rudis (Fabricius), commonly called the cluster fly because of its habit of congregating in attics during the winter, may be easily recognized in its fresh condition by the presence of the loose yellow pile on the sides and dorsum of the thorax. This pile is deciduous and in a rubbed condition the species may be mistaken for a Sarcophagid. However, the family and tribal characters noted above serve to separate it from the Sarcophagidae.

A very common species in eastern North America. Specimens in the National Collection are also from Colorado, Nevada, Utah and California.

Genus **MELANODEXIA** Williston.

Three species of *Melanodexia* are recognized in the present paper based on a study of twenty males and six females. The differences between the species are rather slight and, moreover, the specimens show some individual variation which further complicates their separation. All of the material is from California and Oregon. Nothing is known of their biology.

The species described by Bigot as *Nitellia glabricula* from California may well prove to be a species of this genus.

Key to Species of Melanodexia.

A1. Males.

- B1. Forceps small, length of outside forcep equal to combined width of the four; third antennal joint distinctly narrower than second; size moderate.....*satanica*, new species.
- B2. Forceps elongate, length of outside forceps distinctly longer than combined width of the four; third antennal joint about as broad as second.
 - C1. Palpus not longer than antenna; size moderate, 8 to 9 mm.....*tristis* Williston.
 - C2. Palpus distinctly longer than antenna; larger species, 11 mm.....*grandis*, new species.

A2. Females.

- B1. Frontal vitta parallel sided; palpus not longer than proboscis.....*tristis* Williston.
- B2. Frontal vitta diverging downwards; palpus distinctly longer than antenna.....*grandis*, new species.

Melanodexia tristis Williston.

Description based on type male.

Male.—Head nearly hemispherical, a little broader than high; front black, at narrowest width a little broader than length of third antennal joint, widening out considerably above antennae, swollen in appearance; frontal and ocellar bristles long and slender, about length of arista; first and second joints shining brown; second enlarged and with a long dorsal bristle equal to length of antenna; third joint dark brown, twice as long as wide; arista longer than antenna, with two irregular dorsal rows of rays and a lower row, the outer fourth bare; face large, swollen; facial ridges converging below; vibrissae long, placed well above oral margin; facial carina distinct; distance between lower margin of eye and oral margin equal to width of eye; palpi slender, brownish, with scattered long setae. Thorax shining black, bristles long slender, with fairly long black hairs interspersed (the type specimen has a single pair of anterior acrostichals; two pairs are normal number). Legs not elongate, the bristles rather long, pulvilli and claws of rather large size (said to be small in original description). Abdomen short-conical, with distinct bristles only on distal part, anteriorly with abundant erect hairs. Third longitudinal vein strongly convex in front, terminating very near tip of wing; antepenultimate section of fourth vein fully twice length of penultimate section, the latter joining the ultimate section at an angle. Wings and squamae smoky. Length, 6 mm.

This was very kindly loaned me by the University of Kansas.

Female.¹—Description based on specimens at hand.

¹The female described as allotype by Williston can not be found in the Kansas University collection. From the description it appears to belong to the species described below as *grandis*.

More shining black than the male but still with a decided pollinose cast; the thoracic and abdominal hairs less developed, rather short on the abdomen; front rather broad; frontal vitta with parallel sides; facial carina scarcely perceptible, the antennae consequently nearly touching basally; palpus shorter than proboscis; length equal to that of the male.

Type locality.—Death Valley, California (Baron, collector).

Type.—In Kansas University collection.

Specimens in the National Museum from San Bernardino County (May, D. W. Coquillett); San Diego (March 27, 1915, April 20, 1921, W. S. Wright); Claremont (C. F. Baker; Metz).

There are also three males and one female from Oregon in the collection which may be referable to this species, but some variation is present in these and they have been kept apart for the time being. They appear to be intermediate between *tristis* and *grandis*.

Melanodexia grandis, new species.

Male and female.—This species may be separated from *tristis* by its larger size; head higher than broad; palpus longer than antenna; the longer forceps of the male and broader front of the female in which the frontal vitta widens downwards. Length, 11 mm.; wing, 8.5 mm.

Four males, two females. All from California.

Type locality.—Monterey County, California (July 5, 1896, collector ?).

Other localities.—Pacific Grove (May 9, 1906, J. M. Aldrich); Pleyto, Monterey County (May 22, 1920, E. P. Van Duzee).

Type.—Cat. No. 28,894, U. S. N. M.

Melanodexia satanica, new species.

Male.—About the size of *tristis*; the wings a little more smoky; second antennal joint enlarged and perceptibly broader than third joint; palpus longer than antenna; forceps short, outer forceps only as long as combined width of the four and rather strongly contracted beyond middle but moderately expanded at apex to form a blunt point (sharp-pointed in *tristis* and *grandis*). Length, 9–10 mm.; wing, 8–8.5 mm.

Eight males.

Type locality.—Los Gatos Canyon Divide to mouth of Mount Diablo Ridge, Fresno County, California (June 6–8, 1907, J. C. Bradley).

Type.—Cat. No. 28,893, U. S. N. M.

Two females are at hand from Bairs Ranch, Humboldt County, California (June 9, H. S. Barber) which may prove to belong to this species. They differ from the females of *tristis* and *grandis* principally by their striking shining black coloration. There is also a possibility that they represent

the species described as *Nitellia glabricula* Bigot from a single female from California. This species was described as being shining black.

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A FOREIGN CABBAGE FLEA-BEETLE IN THE UNITED STATES.

BY F. H. CHITTENDEN, *U. S. Bureau of Entomology.*

March 7, 1921, Mr. R. L. Michaud, Rochester, N. Y., wrote for information as to how to dispose of what he termed a "black flea" which was destroying seedling radish. May 7, specimens were furnished which proved to be a *Phyllotreta* not hitherto known as occurring in this country. In regard to the habits of the species, he wrote: "The beetles work hardest when the sun is hot and just as soon as the seed comes through the ground they eat it. All my cabbage is ruined and completely gone. They hide in the ground at night and on cold days. They are attacking not only radish and cabbage but turnip and everything of the cabbage family and last summer when there was nothing like that to feed on they attacked wax beans." Our correspondent found it necessary to dig up his beds for replanting. He stated that the insects did not appear to injure plantings after the middle of August and that this was the third season that they had "cleaned up" in his vicinity. Others who grew radish in the neighborhood experienced the same trouble.